Technical Information

24.2008

New STIHL KM 56 KombiMotor – Series 4144

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The new KombiMotor stands out by virtue of its modern appearance and exceptional ease of use.

The overall concept was designed for high reliability, ruggedness and low maintenance requirements.

The ergonomically designed operating elements, together with the favorable power-to-weight ratio and easy starting, make these machines easy to handle and comfortable to use.

The KombiMotor (abbreviation "KM") is available with a loop handle and Easy2Start!™ as the **KM 56 RC**. When the loop handle is used with a barrier bar, all KombiTools can be connected to the KombiMotor without restrictions.

The following KombiTools are currently available: FS-KM, FSB-KM, HL-KM 0°, HL-KM 135°, FH-KM 135°, BG-KM, HT-KM, BF-KM, FCB-KM, FCS-KM, KB-KM and KW-KM, as well as the HT Shaft Extension and HT/HL CFK Shaft Extension.

The KombiTools can be ordered individually.

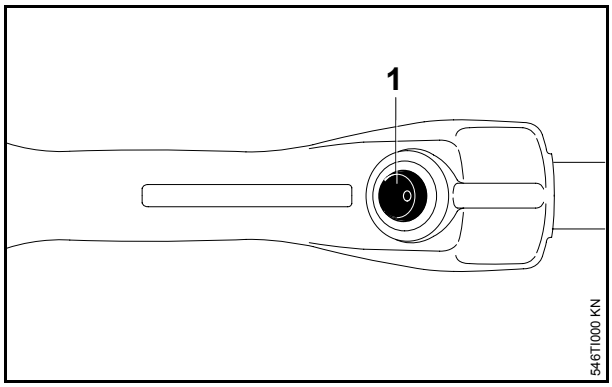
By swapping the KombiTools, it is possible to cover a broad range of applications and uses.

The multi-purpose STIHL KombiSystem is highly versatile: Customers can choose which KombiTool they want supplied as original equipment with their KombiMotor.

KombiMotor and KombiTool can be easily transported and stored in minimum space.

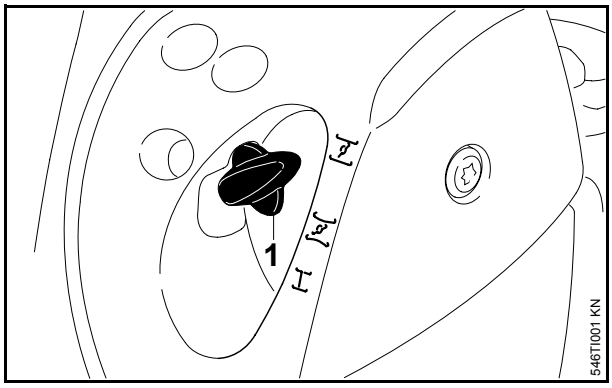
1. Technical description

1.1 Function of stop switch and ignition



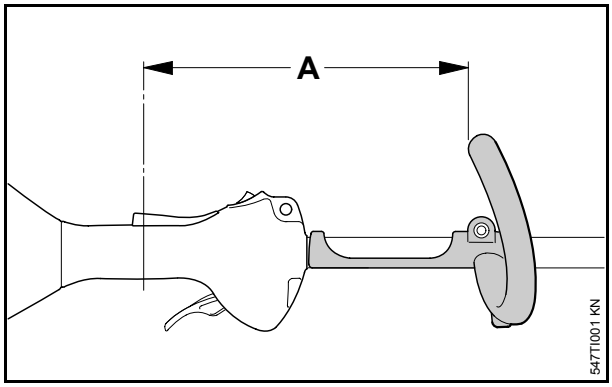
When the stop switch (**1**) is not actuated, it remains in the position **Run**: The ignition is on – the engine is ready for starting and can be started. If the stop switch is pressed into the position **0**, the ignition is switched off. Once the engine comes to a complete stop, the ignition automatically resets so the engine can be started.

1.2 Choke lever



To start the engine, the choke lever (**1**) must be pressed and rotated to the position Cold start or Warm start . Once the engine has been started and the interlock lever and throttle trigger have been engaged, the choke lever automatically returns to the position Run . It will not be necessary to move the choke lever to the position Run by hand.

1.3 Loop handle



When the loop handle is secured flush against the engine housing, the recommended minimum distance (**A**) between the loop handle and controls is ensured by the design of the loop handle. The distance is approx. 7.9 in (200 mm). No additional aids are required for setting the minimum distance.

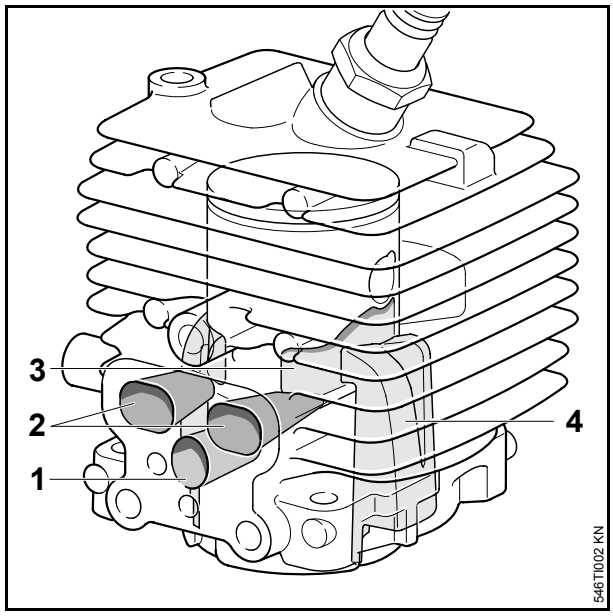
The new machine is delivered with the loop handle pre-assembled on the unit. The barrier bar mounts with just one screw, so the KombiMotor can be used with all KombiTools.
The barrier bar must be mounted before delivery of the KombiMotor.

1.4 Versions with STIHL Easy2Start™

- for reduced cranking effort and lower cranking speed
- smooth starts

1.5 Engine with stratified scavenging

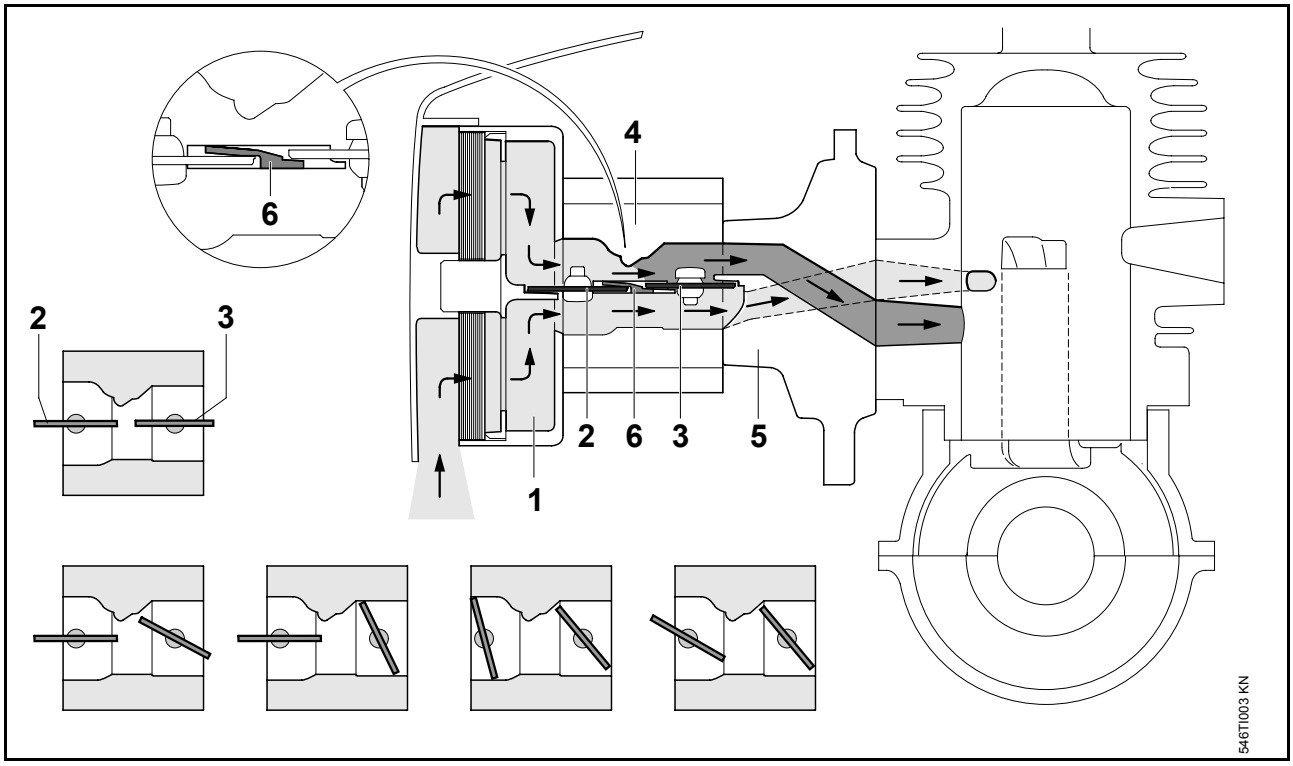
1.5.1 Mechanical Design



Fresh mixture (**1**) and clean air (**2**) are fed into different ports via the carburetor. Integrally molded control channels (**3**) on both sides of the piston skirt. Open and close the connection between the clean air port and the transfer port (**4**). No additional components are required for controlling the clean air.

An air cushion (air without fuel) separates the fresh mixture (fuel-air mixture) and exhaust. The air cushion is placed in front of the fresh mixture. At the beginning of the "exhaust and transfer" stroke, air without fuel flows from the transfer ports into the combustion chamber purging the exhaust gases and preventing the incoming fresh mixture from exiting the exhaust port. This results in reduced emissions through the reduction of fresh mixture losses and lower fuel consumption.

1.5.2 Carburetor



a) Full load, partial load b) Idle c) Cold start d) Warm start

Full load and partial load

The air filter (**1**) divides the intake air into two streams. The choke shutter (**2**) and throttle shutter (**3**) are open. The intake air flows above and below the choke and throttle shutters through the carburetor (**4**). The fuel is drawn into the top part of the carburetor and flows through the venturi – where the fresh mixture is formed.
The spacer flange (**5**) channels the fresh mixture into the crankcase and the clean air into the transfer ports.

In the carburetor, there is a baffle plate (**6**) that separates the fresh mix and clean air paths from one another.

Idle

The choke shutter is open. The throttle shutter is closed so that only a small gap remains open at the carburetor housing. A rich mixture is drawn in through the idle hole located at the gap. Air dilutes the rich mixture into an optimal idle mixture which is then drawn into the crankcase.

Cold start

During a cold start, the choke shutter is closed. The throttle shutter is slightly open. The amount of air necessary for an optimal starting mixture is drawn in through the air bleed holes in the choke shutter; the necessary amount of fuel is drawn in from the idle and main jet.

Warm start

During a warm start, the choke and throttle shutters are opened to a defined angle so an ideal mixture of air and fuel is fed to the engine for starting.

2. Specifications

2.1 Engine

Single cylinder two-stroke engine	
Displacement:	1.66 cu. in (27.2 cc)
Bore:	1.34 in (34 mm)
Stroke:	1.18 in (30 mm)
Engine power to ISO 8893:	1.08 bhp (0.8 kW)
Torque:	0.99 lbs.ft (1.35 Nm)
Idle speed:	2800 rpm (1/min)
Clutch engages at:	4200 rpm (1/min)
Cut-off speed (Nominal value):	10000 rpm (1/min)
Starter mechanism: – Starter rope: – Pull-out reserve:	Dual pawl system Diameter 0.106 in, length 35.8 in (Diameter 2.7 mm, length 910 mm) 1.25 – 2.25 revolutions

2.2 Fuel system

Carburetor: all-position diaphragm carburetor with integral fuel pump.

Settings	
High speed screw **H** (basic setting) – **without** limiter cap for servicing dealers: – **with** limiter cap for users:	 **1 1/2** turns open **3/4** turn counterclockwise (max. to stop)
Low speed screw **L** (Standard setting):	**3/4** turn counterclockwise
Idle speed screw **LA**:	As required, cutting tool must not turn

Fuel tank capacity:	11.5 fl.oz (340 cc)
Fuel mixture:	See instruction manual
Mix ratio:	See instruction manual

2.3 Ignition system

Ignition module:	with electronic magneto ignition
Spark plug (suppressed):	NGK CMR 6 H
Electrode gap:	0.020 in (0.5 mm)

2.4 Weight and dimensions

KombiMotor, with Easy2Start™	**Overall length** without KombiTool	**Weight** without KombiTool, without fuel
KM 56 RC:	33.1 in (840 mm)	9.5 in (4.3 kg)

R = Loop handle

KombiTools	**Overall length** without KombiMotor	**Weight** without KombiMotor
FS-KM:	37.0 in (940 mm)	2.6 lbs (1.2 kg) [1)]
FSB-KM:	30.3 in (770 mm)	1.6 lbs (0.7 kg) [1)]
HL-KM 135°:	63.0 in (1600 mm)	5.7 lbs (2.6 kg)
HL-KM 0°:	45.7 in (1160 mm)	4.0 lbs (1.8 kg)
FH-KM 135°:	52.4 in (1330 mm)	5.3 lbs (2.4 kg)
BG-KM:	35.0 in (890 mm)	4.0 lbs (1.8 kg)
HT-KM:	49.6 in (1260 mm)	4.2 lbs (1.8 kg) [2)]
BF-KM:	39.4 in (1000 mm)	9.0 lbs (4.1 kg) [3)]
FCB-KM:	36.2 in (920 mm)	4.9 lbs (2.2 kg) [4)]
FCS-KM:	39.4 in (1000 mm)	5.7 lbs (2.6 kg) [4)]
KB-KM:	49.2 in (1250 mm)	14.1 lbs (6.4 kg) [3)]
KW-KM:	49.2 in (1250 mm)	16.3 lbs (7.4 kg) [3)]

1) Without cutting attachment, without deflector
2) Without bar and chain
3) With deflector
4) With cutting attachment and deflector

3. KombiTools

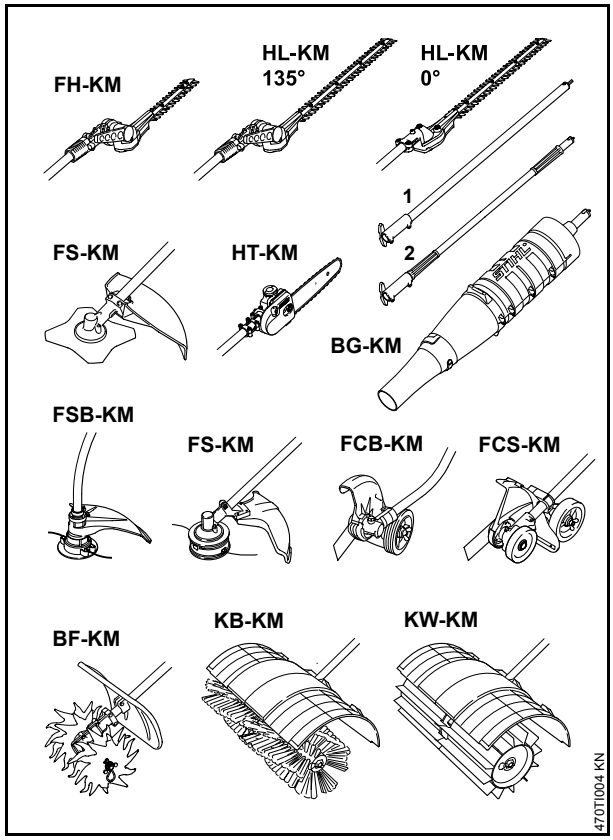
3.1 KombiTools

The following KombiTools are available:

KombiTools	Intended use
FS-KM	Trimmer with mowing head
FS-KM	Trimmer with grass cutting blade
FSB-KM	Trimmer with curved shaft and mowing head
HL-KM 135°	Hedge trimmer, adjustable
HL-KM 0°	Hedge trimmer
FH-KM 135°	Power Scythe, adjustable
BG-KM	Blower
HT-KM	Pole pruner
BF-KM	Soil cultivator
FCB-KM	Edger
FCS-KM	Edger
KB-KM	Bristle brush
KW-KM	STIHL PowerSweep™

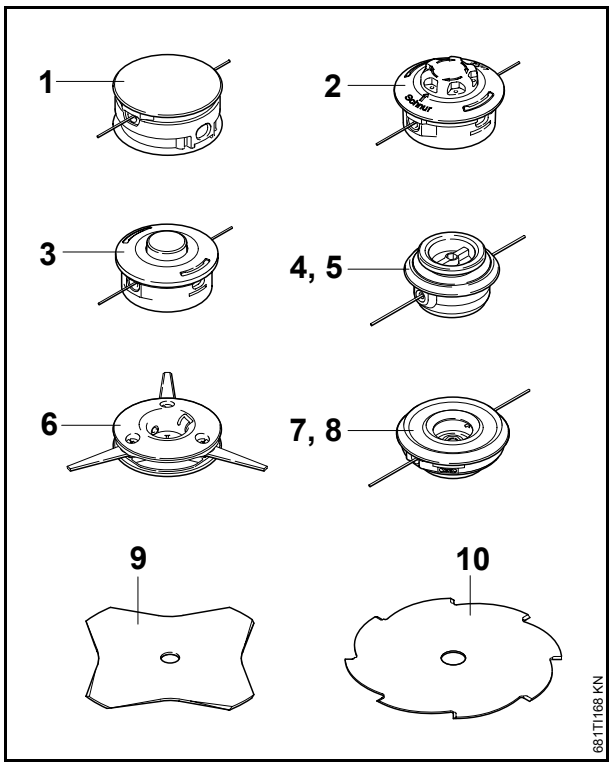
1 Extension drive tube, approved for use on HT-KM only
2 Carbon Extension drive tube, approved for use on HT-KM, HL-KM 0° and HL-KM 135°

Information regarding loop handle with barrier bar – see 🕮 1.3



3.2 Cutting attachments for FS-KM

The following cutting attachments are approved for FS-KM:



Mowing heads

1	STIHL SuperCut™ 20-2	4002 710 2184
2	STIHL AUTOCUT® C 25-2	4002 710 2196
3	STIHL AUTOCUT® 25-2	4002 710 2191
4	STIHL TrimCut™ 30-2	4002 710 2193
5	STIHL TrimCut™ 31-2	4002 710 2156
6	STIHL PolyCut™ 20-3	4002 710 2189
7	STIHL FixCut™ 25-2	4001 710 2131
8	STIHL FixCut™ 25-2	4002 710 2158

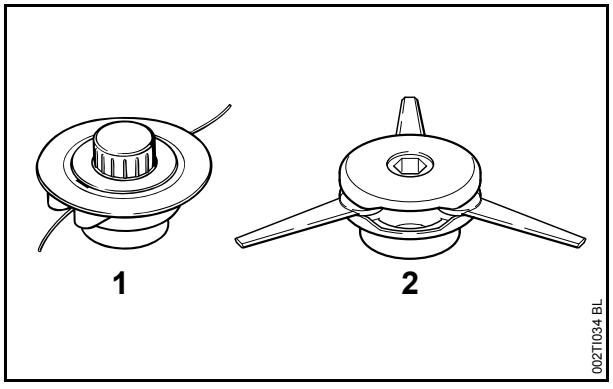
Metal cutting tools

9	Grass cutting blade 230-4	4001 713 3801
10	Grass cutting blade 230-8	4001 713 3803

All cutting attachments listed must be used with approved deflectors (see catalog "Cutting Attachments & Accessories for Brushcutters and Trimmers").

3.3 Cutting attachments for FSB-KM

The following cutting attachments are approved for FSB-KM:



Mowing heads

1	STIHL AUTOCUT® 11-2	4004 710 2192
2	STIHL PolyCut™ 5-3	4004 710 2180

All cutting attachments listed must be used with approved deflectors (see catalog "Cutting Attachments & Accessories for Brushcutters and Trimmers").

4. Special accessories

4.1 General

Part name	Part No.	Use
Harness	4130 710 9000	
Full harness	4119 710 9001	
Spool with nylon line	see catalog "Cutting Attachments & Accessories for Brushcutters and Trimmers"	for mowing heads STIHL SuperCut™ 20-2, AUTOCUT® C 25-2, AUTOCUT® 25-2
Replacement blades (pack of 12)	4111 007 1001	for mowing head STIHL PolyCut™ 20-3
Transport guard	4119 790 3906	for grass cutting blades

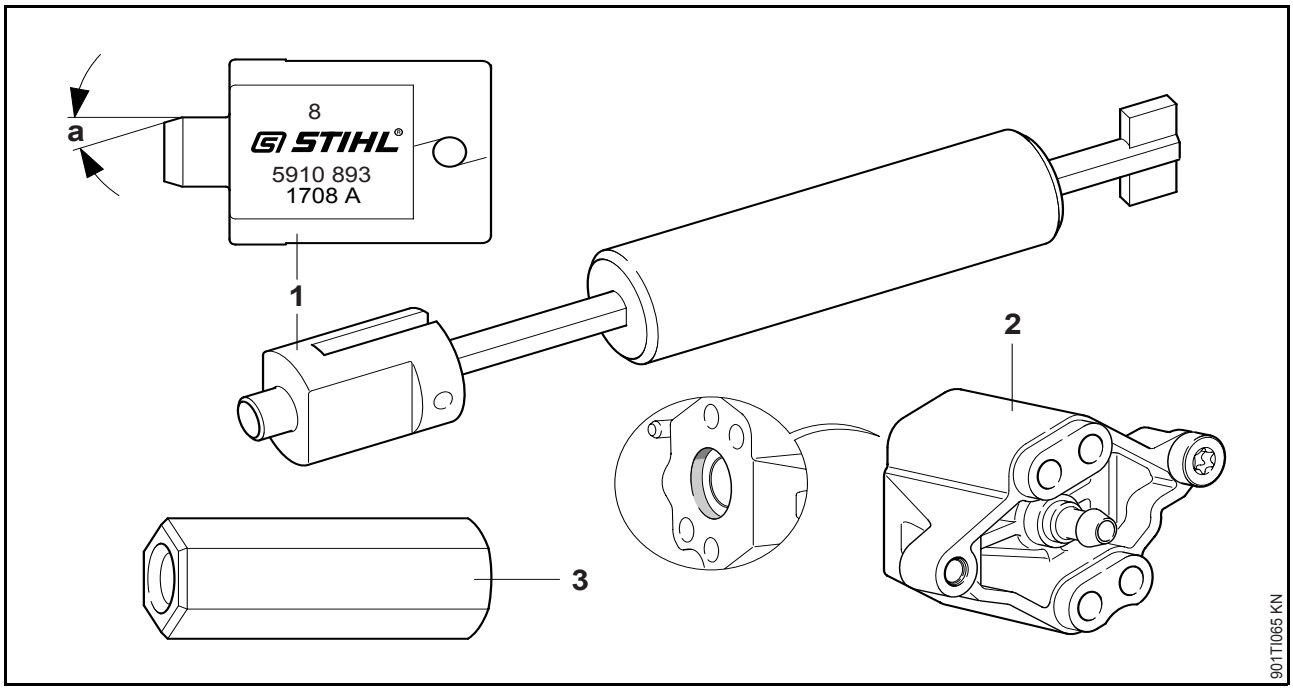
4.2 Nylon line for mowing heads

Line diameter / color	Use
0.095 in (2.4 mm) / orange	STIHL SuperCut™ 20-2, AUTOCUT® C 25-2, AUTOCUT® 25-2, TrimCut™ 30-2, TrimCut™ 31-2, STIHL PolyCut™ 20-3, FixCut™ 25-2
0.105 in (2.7 mm) / red	AUTOCUT® 25-2, TrimCut™ 30-2, TrimCut™ 31-2, STIHL PolyCut™ 20-3, FixCut™ 25-2

5. Servicing accessories

5.1 Special tools

The following new special tools are required for the KM 56 RC:



The sleeve (**1**) of installing tool 5910 890 2208 has a new camfer angle (**a**) of 20 degrees. The previous sleeve had a camfer angle of 45 degrees. The new sleeve 5910 893 1708 replaces previous sleeve 5910 893 1703.

Recommendation: Retrofit special tool 5910 890 2208 with new sleeve 5910 893 1708 and update existing stocks of special tool 5910 890 2208 with the new sleeve 5910 893 1708.

Flange (**2**) 5910 850 4200 replaces previous flange 1128 850 4200. The new flange has an additional recess at the sealing surface facing the spacer flange.

The puller (**3**) has a 3/8" thread and may only be used for Series 4144 and 4140. This puller cannot be used with metric threads because thread damage will occur.

The existing special tools are listed in the service manual for STIHL KM 56 RC.

Item	Part name	Part No.	Use
1	Sleeve	5910 893 1708	Installing hookless snap rings in pistons (supplement to installing tool 5910 890 2208)
2	Flange	5910 850 4200	Engine leakage test
3	Puller	5910 893 0800	Removing the flywheel

5.2 Aids

Part name	Part No.	Use
Starter rope 35.8 in (910 mm)	4137 195 8200	Rewind starter
ElastoStart™ (special accessory) – Starter rope 35.8 in (910 mm)	0000 190 3403 4137 195 8200	Starter mechanism (handle with rope)
Set of carburetor parts	4241 007 1002	Carburetor Zama C1M-S145 Carburetor Zama C1M-S146 (only for California)
STIHL gear lubricant for hedge trimmers – 3 oz (80 g) tube – 8 oz (225 g) tube	 0781 120 1109 0781 120 1110	Drive shaft in drive tube
NEW: STIHL fitting paste – 1.8 oz (50 g) tube	 0781 130 1014	 Paste contains molybdenum sulfide and graphite; use for lubrication between crankshaft stub and clutch drum
STIHL special oil – 3.4 fl.oz (100 ml) bottle	 0781 417 1315	Rewind spring in rewind starter Bearing bore in rope rotor
Standard solvent-based degreaser not containing any chlorinated or halogenated hydrocarbons		Cleaning the crankshaft stub and cone on the flywheel (see TI 25.2005)

6. Spare parts

Separate spare parts documentation will be available for KM 56 RC when it is launched on the market.

7. Servicing

The safety instructions in the instruction manual must be observed if the machine is started during servicing.

7.1 Service manuals

The following manuals can be used for repairs within the KombiSystem:

For KombiMotor KM 56 RC (powerhead 4144)		For the KombiTools
Service manual **Powerhead** 4144 0455 938 0123	Service manual **Components** 4144 0455 545 0123	Service manual **KombiTools** 0455 227 0123

7.2 Tightening torques

The tightening torques are specified in the service manual.

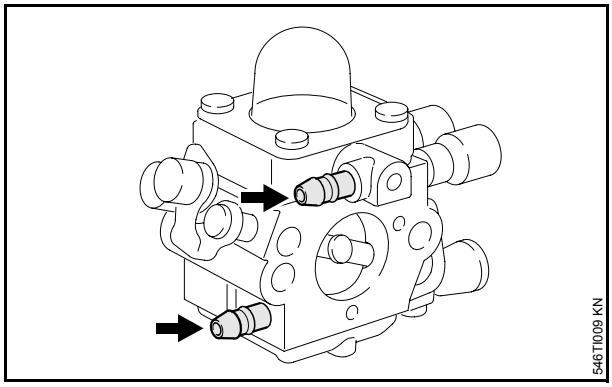
7.3 First use after long periods of storage

In isolated cases, problems may be experienced with starting when the machine is stored over a period of several months and at temperatures under (40 degrees) 5 °C.
In this case, press the manual fuel pump several times in order to purge the carburetor. Afterwards, wait a few minutes, then start the engine.

Recommendation: Before storing the machine for an extended period, always run the engine until the carburetor is dry, otherwise the carburetor diaphragms may stick together – see also "Storing the machine" in the owner's manual.

7.4 Maintenance and Repairs

7.4.1 Barbed connectors on the carburetor



The carburetor has two barbed connectors (arrows) on which the fuel hoses are seated. In order to ensure there are no leaks in the fuel system, it is important to follow the steps listed below:

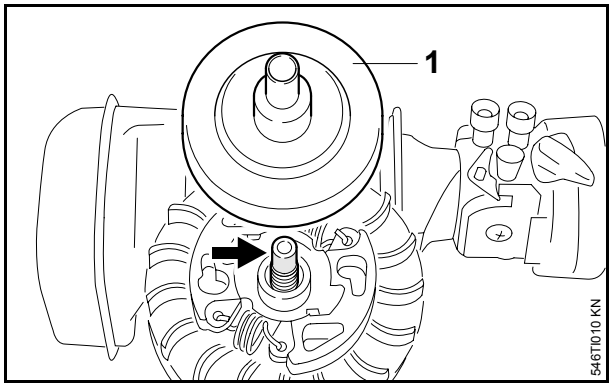
- Install and remove fuel hoses, by hand whenever possible, in order to avoid damage to the barbed connector – sharp-edged pliers, screwdrivers, etc., must not be used – nor should fuel hoses be cut open with a knife or similar implement.
- Do not reuse fuel hoses after disassembly, always replace them with new hoses – fuel hoses may be over-extended when removed.
- Install new fuel hoses dry or with the aid of press fluid OH 723 – 0781 957 9000. Other press fluids are not permitted and may lead to fuel hose damage.
- When using press fluid OH 723, apply press fluid to the ends of the hose and connectors prior to installation.

Notes regarding press fluid OH 723

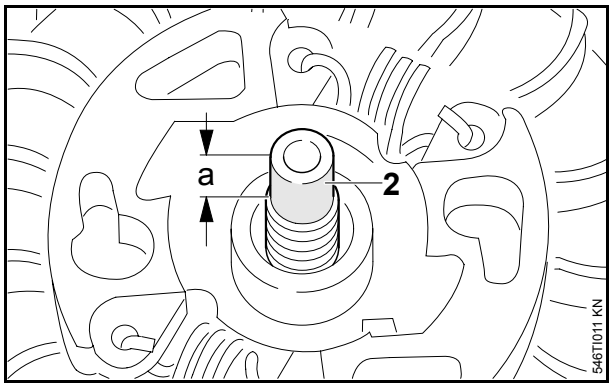
Press fluid OH 723 produces a lubricant film to aid in assembly. The lubricant evaporates after a short time allowing for a tight fit.

Never use fuel, oil or grease as a lubricant. Fuel, oil and grease does not evaporate and may allow the hose to slip from the connector.

7.4.2 Installing the clutch drum



For installation of the clutch drum (**1**), the crankshaft stub (arrow) must be lubricated with the new fitting paste 0781 130 1014.

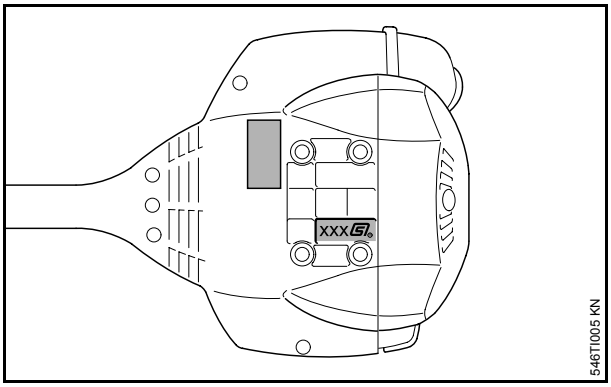


Coat the crankshaft stub (**2**) with fitting paste in area a = 0.4 in (10 mm).

Notes regarding fitting paste: If fitting paste is not applied to the crankshaft stub or the carburetor is improperly adjusted, the cutting tool may rotate when the machine is idling.
If the cutting tool turns when the machine is idling, check for proper carburetor adjustment and verify fitting paste has been applied to the crankshaft stub.

The fitting paste can also be used with the previous models FS 45, FS 55 and KM 55.

7.5 Serial number



The serial number is located in two places on the underside of the engine housing – as shown in the illustration.

7.6 Repair times

The specified repair times apply for trained and qualified personnel as well as for properly equipped repair shops.

The repair times are specified in minutes.

This table for the KM 56 RC can be added to the STIHL repair times table.

Code	Type of Repair	KM 56 RC
2	Replace crankcase, crankcase gasket or re-seal crankcase. Includes air leak test.	50
3	Replace crankshaft main bearing(s). Includes air leak test.	50
4	Replace crankshaft seal(s). Includes air leak test.	50
5	Perform engine air leak test.	30
6	Replace cylinder and/or piston. Includes air leak test and repair of components causing failure.	50
7	Replace ignition module or flywheel. Includes stop circuit test.	30
8	Replace fuel tank line, tank vent, or fuel pick-up body.	20
9	Replace intake manifold or intake flange.	20
10	Repair or replace carburetor. Includes fuel system testing.	30
11	Repair throttle control.	20
12	Repair or replace rewind starter.	15
13	Repair or replace clutch, clutch shoes or clutch springs.	30
14	Replace muffler.	15
15	Replace air filter or filter housing.	15
16	Repair or replace stop switch. Includes circuit testing.	25
17	Replace clutch housing.	20
18	Replace outer drive tube.	30
19	Replace shaft coupler or gear box.	15
21	Replace drive shaft.	15
22	Replace fuel tank.	20
40	Miscellaneous repairs and other repairs not listed.	15
45	Handling allowance only-no labor.	10
50	No labor.	0

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